

2.8 Paleontology

2.8.1 Regulatory Setting

Paleontology is a natural science focused on the study of ancient animal and plant life as it is preserved in the geologic record as fossils. A number of federal statutes specifically address paleontological resources, their treatment, and funding for mitigation as a part of federally authorized projects.

16 United States Code (USC) 470aaa (the Paleontological Resources Preservation Act) prohibits the excavation, removal, or damage of any paleontological resources located on federal land under the jurisdiction of the Secretaries of the Interior or Agriculture without first obtaining an appropriate permit. The statute establishes criminal and civil penalties for fossil theft and vandalism on federal lands.

23 United States Code (USC) 305 authorizes the appropriation and use of federal highway funds for paleontological salvage as necessary by the highway department of any state, in compliance with 16 USC 431-433 above and state law.

Under California law, paleontological resources are protected by the California Environmental Quality Act (CEQA).

2.8.2 Affected Environment

This section is based on the *Paleontological Identification Report and Paleontological Evaluation Report* (2017).

The paleontological study area consisted of the project limits (refer back to Figure 1-2, in Chapter 1) along State Route 74 (SR-74), which extend from 0.8 mile west of the San Juan Fire Station to the Orange/Riverside County line (approximately Post Miles [PM] 11.50–16.60); however, the project excludes construction along the historic San Juan Canyon Bridge (PM 13.28–13.33). The paleontological locality search included an area extending over one mile from the paleontological study area in order to assist with determining the paleontological sensitivities of geologic sediments that are present within that study area, which includes both the horizontal and vertical extent of anticipated ground-disturbing activities.

In May 2017, paleontological resource locality searches were completed through the Natural History Museum of Los Angeles County (LACM) and the San Diego Natural History Museum (SDNHM). LSA also conducted a literature review of geologic maps

and relevant geological and paleontological literature. In addition, on June 20, 2017, a pedestrian survey of the project area was conducted.

The project area is located in the Peninsular Ranges Geomorphic Province, which extends from the Transverse Ranges in the north to the tip of Baja California in the south and includes the Los Angeles Basin. This province extends from the Colorado Desert in the east to the Southern Channel Islands in the west. It is characterized by a series of mountain ranges and valleys and contains pre-Cenozoic igneous and metamorphic rocks covered by a veneer of Cenozoic sedimentary deposits.

Geologic mapping indicates that the project area contains Young Axial Channel Deposits; Young Landslide Deposits; Old Axial Channel Deposits; Very Old Axial Channel Deposits; the Trabuco Formation; and the following: Rocks of the Peninsular Ranges Batholith: Granite, Undifferentiated; Gabbro, Undifferentiated; Heterogeneous Granitic Rocks; Santiago Peak Volcanics; and Rocks of Meniffee Valley, Undifferentiated. Artificial Fill is also likely present from the surface to varying depths throughout much of the project area where it was placed during the construction of SR-74.

According to the fossil locality searches conducted by the LACM and the SDNHM, there are no known fossil localities within the boundaries of the project area. Neither museum has records of fossil localities from the majority of the geologic units within the project area. However, the LACM has records of two fossil localities outside the project area from Pleistocene deposits similar to the older deposits in the Young Axial Channel Deposits, the Old Axial Channel Deposits, and the Very Old Axial Channel Deposits mapped in the project area. The closest vertebrate fossil locality from Pleistocene deposits is LACM 4119, located northwest of the project area in a drainage leading into Oso Creek. This locality produced a specimen of bison (*Bison*). The next closest recorded locality from these deposits is LACM 1215, which is located in Oso Creek west-southwest of the project area near the intersection of Crown Valley Parkway and Interstate 5, and produced undetermined shark (*Chondrichthyes*) and mammal (*Mammalia*) teeth. The LACM also suggested that the Jurassic Bedford Canyon Formation is present within the project area and described an important fossil recovered from that formation in the Santa Ana Mountains.

The SDNHM does not have any fossil localities from Pleistocene deposits near the project area; however, this museum notes that Pleistocene siltstone and sandstone deposits in San Diego County similar to the older deposits in the Young Axial Channel

Deposits, the Old Axial Channel Deposits, and the Very Old Axial Channel Deposits in the project area have produced fossilized vertebrate remain; including turtles, birds, wolves, rodents, rabbits, camels, deer, horses, mastodons, mammoths, and ground sloths.

The pedestrian survey indicated that the western end of the project area contained deposits that have a high sensitivity for paleontological resources. The remainder of the project area primarily contained deposits with low or no sensitivity for paleontological resources. Artificial Fill was present along the sides of SR-74 throughout the project area. No paleontological resources were observed during the survey.

2.8.3 Environmental Consequences

2.8.3.1 Temporary Impacts

Build Alternative (Preferred Alternative)

The Build Alternative would require ground disturbance, excavation, and modifications to existing freeway facilities and structures. Excavation in areas that have high paleontological sensitivity could result in impacts to paleontological resources. The construction of the Build Alternative would not result in temporary impacts to paleontological resources because the impacts to those types of resources during construction would be considered permanent. Those impacts to paleontological resources are described later in Section 2.9.3.2, Permanent Impacts.

No Build Alternative

Under the No Build Alternative, none of the proposed improvements to SR-74 would be constructed. The No Build Alternative would maintain its existing conditions; therefore, the No Build Alternative would not result in temporary adverse impacts related to paleontological resources as a result of construction activities.

2.8.3.2 Permanent Impacts

Build Alternative (Preferred Alternative)

The Build Alternative would require ground disturbance, excavation, and modifications to existing freeway facilities and structures. The western end of the project area contains Old Alluvial Fan Deposits and Very Old Alluvial Fan Deposits, which are deposits with high paleontological sensitivity. Excavation in areas that have high paleontological sensitivity could result in impacts to paleontological resources. Excavation in the western end of the project area is expected to be from one to five feet below the surface. As a result, it is likely that paleontological resources would be permanently impacted during excavation of the Build Alternative.

No Build Alternative

Under the No Build Alternative, none of the proposed improvements to SR-74 would be constructed. The No Build Alternative would maintain the existing conditions; therefore, the No Build Alternative would not result in permanent adverse impacts to paleontological resources as a result of construction activities.

2.8.4 Avoidance, Minimization, and/or Mitigation Measures

In most cases, avoidance and minimization are not viable options as the specific locations of fossils within the scientifically significant geologic units are unknown and geologic units can extend for great distances both horizontally and vertically. However, implementation of Mitigation Measure PAL-1, described below, would reduce impacts to nonrenewable paleontological resources during construction.

PAL-1 Concurrently with the development of final design plans, a Paleontological Mitigation Plan (PMP) shall be developed. The PMP will follow the guidelines in the California Department of Transportation (Caltrans) *Standard Environmental Reference (SER), Environmental Handbook*, Volume 1, Chapter 8 – Paleontology (February 2012 or more current), as well as guidelines from the Society of Vertebrate Paleontology (SVP). The PMP shall include sections describing project activities, the geologic units within the project area and their paleontological sensitivities, the work plan for mitigating project impacts to paleontological resources (e.g. construction monitoring), estimates of monitoring schedules and costs, decision thresholds for monitoring levels and fossil collections, a recommended repository for recovered fossils, any necessary permits, and the appropriate documentation at the end of the monitoring program. Once the PMP has been prepared, the paleontological resource protocols and procedures within it shall be incorporated into the Project Plans, Specifications, and Estimates (PS&E).